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(71)Applicant : MATSUSHITA ELECTRIC IND CO
LTD

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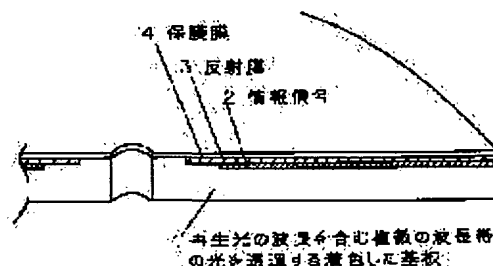
(72)Inventor : UENO FUMIAKI

(54) OPTICAL DISK AND ITS PRODUCTION

(57)Abstract:

PURPOSE: To facilitate the discrimination from ordinary optical disk and the unfair reproduction and the identification of the front and rear of a both side pasted disk and the specification of the disk by forming a substrate of a material colored to allow the transmission of light of plural optical wavelength bands.

CONSTITUTION: This optical disk is produced by forming the substrate 1 of the material prepd. by incorporating transparent resin raw materials with plural pigments or dyes and laminating information signals 2, a reflection film 3 and a protective film 4 on the substrate. As a result, the transmission of the reproducing light of the plural specific wavelength bands is made possible by combining the plural pigments or dyes, by which the discrimination from the ordinary disks is made possible and the observation of signal pits is made infeasible. The illicit reproduction is thus prevented. The easy identification of the front and rear is facilitated by changing the colors of the respective surfaces. Further, the signal reproducing surface is printed with a label with ink to allow transmission of the light of the reproducing wavelengths, by which the specification of the disk is facilitated.



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(71)Applicant : NEC CORP

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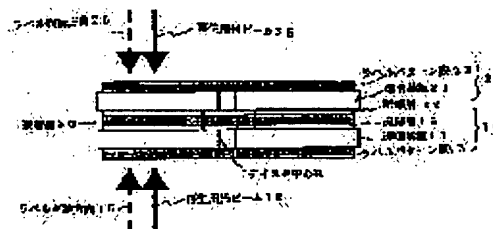
(72)Inventor : ITO MASAKI

(54) INFORMATION RECORDING MEDIUM

(57)Abstract:

PROBLEM TO BE SOLVED: To provide an information recording medium which can reproduce information from both planes of surface and back to which labels having size being easy to read is attached even if a cartridge is not provided.

SOLUTION: This recording medium is provided at least a recording layer 12 on a transparent substrate 11, information of the recording layer 12 is reproduced by focusing and irradiating a light beam 15 on the recording layer 12 through the transparent substrate 11 rotating the transparent substrate 11. In this case, a label pattern film 13 is formed on a transparent substrate plane of an incident plane side of the light beam 15 of a region of the recording layer 12, and the label pattern film 13 has such a characteristic that transmissivity is large at approximately wavelength of the light beam 15 and reflectance or absorptivity is large at one part of the other wavelength.



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CLAIMS

[Claim(s)]

[Claim 1] In the information record medium which reproduces the information on the aforementioned record layer by converging a light beam on the aforementioned record layer, and irradiating it through the aforementioned transparent substrate, preparing a record layer at least on a transparent substrate, and rotating the aforementioned transparent substrate It is the information record medium which forms a label pattern film in the aforementioned transparent substrate side by the side of the aforementioned light beam plane of incidence of the field of the aforementioned record layer, and is characterized by the aforementioned label pattern film having the property that the permeability near the wavelength of the aforementioned light beam is large, and a reflection factor or an absorption coefficient is large on a part of other wavelength.

[Claim 2] A record layer is prepared at least on a transparent substrate. It is the information record medium which reproduces the information on the aforementioned record layer by converging a light beam on the aforementioned record layer, and irradiating it through the aforementioned transparent substrate, rotating the aforementioned transparent substrate, and a transparent substrate is the structure of the first transparent substrate and the second transparent substrate where there are at least 2 sets and it was ***** (ed). In the information record medium which reproduces the information on the first record layer if it lets the transparent substrate of the above first pass, and reproduces the information on the second record layer if it lets the transparent substrate of the above second pass The label pattern film showing the contents of the record layer of the above first The label pattern film which forms in the transparent substrate side of the above second by the side of the light beam plane of incidence of the field of the record layer of the above second, and expresses the contents of the record layer of the above second It is the information record medium which forms in the transparent substrate side of the above first by the side of the light beam plane of incidence of the field of the record layer of the above first, and is characterized by the aforementioned label pattern film having the property that the permeability near the wavelength of the aforementioned light beam is large, and a reflection factor or an absorption coefficient is large on a part of other wavelength.

[Claim 3] A label pattern film is an information record medium according to claim 1 or 2 which is a laminate film.

[Claim 4] A label pattern film is an information record medium according to claim 1 or 2 which is a multilayer interference film.

[Claim 5] A label pattern film is an information record medium according to claim 1 or 2 which is the film which mixed blue system coloring matter to the resin binder.

[Claim 6] A label pattern film is an information record medium according to claim 1 or 2 which is the film which mixed red system coloring matter to the resin binder.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] this invention relates to information record media, such as an optical disk medium which can reproduce record of mass information, using a light beam.

[0002]

[Description of the Prior Art] The optical disk has the feature which was very excellent as accumulation equipment of a lot of information like the hard disk. Since especially an optical disk can perform informational record and reproduction by the light beam and can carry only the information storage section, it is most suitable as distribution of multimedia information data, such as dynamic-image data which need super-large capacity, and a conveyance medium.

[0003] The conventional optical disk medium forms spirally the guide rail of a minute crevice, such as width-of-face [of 0.56 micrometers], and pitch 1.12micrometer, in the front face of transparent substrates, such as a polycarbonate of the shape of a disk, such as 0.6mm **, on this substrate front face, is sputtering etc. and forms the thin film of magneto-optic-recording material, such as a thin film of phase-change record material, such as GeSbTe and AgInSbTe, or TbFeCoTi, and TbFeCoTa. The thin film layer of this record material is ZnS and SiO₂. Mixture and Si₃N₄ It is inserted in many cases in protective coat layers, such as transparent dielectrics, such as a compound and a tantalum-acid ghost. Furthermore on it, a reflective membrane layer or thermolysis layers, such as aluminum alloy, Si, or an Si/aluminum alloy cascade screen, are prepared in many cases. Furthermore, protective coat layers, such as ultraviolet-rays hardening resin and an inorganic dielectric, are prepared in many cases on it. These laminated structures will also generate the multiplex interference effect of light besides the above-mentioned function, and the whole will commit one record layer according to this effect. A record material thin film layer carries out a transparent substrate outside inside, and these laminated materials have many ***** cases in two sheets. Since it becomes reproducible [information] (and record) from both sides by doing in this way, storage capacity of an information record medium can be made into double precision.

[0004] Moreover, as an optical disk medium only for reproduction, on the front face of transparent substrates, such as disk-like polycarbonates, such as 0.6mm **, the pit of circular or an ellipse is formed and it is considering as the record layer by [minute] preparing the reflective membrane layer of aluminum or aluminum alloy by sputtering etc. on this substrate front face.

[0005] After this guide rail or a transparent-with pit substrate exposes a positive-type photoresist by the laser beam and starts the photoreaction, it is developed, forms a crevice, produces a stamper by making this into a mold, and is reproduced in large quantities by methods, such as injection molding, using this stamper.

[0006] Record and reproduction of the information on this conventional optical disk medium perform a laser beam beam among the toothing-like guide rail circumferences through a transparent substrate by irradiating one side as a code track to either a slot (crevice) or a flat part (heights).

[0007] This laser beam beam is narrowed down to the diameter of about a little less than 1 micrometer with an objective lens. A focus servo is performed in order to make this laser beam beam narrowed down small focus in a record layer.

[0008] The above-mentioned guide rail is used for the truck servo to which a laser beam beam carries out positioning imitation of the code-track position correctly. The position gap signal (truck error signal) of a laser beam beam and a guide rail is detected by the push pull method etc. That is, the position gap with the guide rail on an optical disk medium and a laser beam beam is detected from the difference of the photocurrent which detected the far field pattern of the reflected light from an optical disk medium by the

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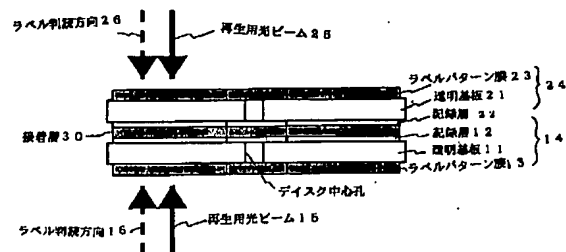
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(54) 【発明の名称】 情報記録媒体

(57) 【要約】

【課題】 カートリッジなしであっても判読し易い大きさのラベルが付いた表裏両面から情報再生可能な情報記録媒体を提供する。

【解決手段】 透明基板 1 1 上に記録層 1 2 を少なくとも設け、前記透明基板 1 1 を回転させながら前記透明基板 1 1 を通して光ビーム 1 5 を前記記録層 1 2 に集束させて照射することにより前記記録層 1 2 の情報を再生する情報記録媒体において、前記記録層 1 2 の領域の前記光ビーム 1 5 入射面側の前記透明基板面にラベルパターン膜 1 3 を形成し、前記ラベルパターン膜 1 3 は前記光ビーム 1 5 の波長付近での透過率が大きくその他の波長の一部では反射率あるいは吸収率が大きい特性を有することを特徴とする。



【特許請求の範囲】

【請求項1】 透明基板上に記録層を少なくとも設け、前記透明基板を回転させながら前記透明基板を通して光ビームを前記記録層に集束させて照射することにより前記記録層の情報を再生する情報記録媒体において、前記記録層の領域の前記光ビーム入射面側の前記透明基板面にラベルパターン膜を形成し、前記ラベルパターン膜は前記光ビームの波長付近での透過率が大きくその他の波長の一部では反射率あるいは吸収率が大きい特性を有することを特徴とする情報記録媒体。

【請求項2】 透明基板上に記録層を少なくとも設け、前記透明基板を回転させながら前記透明基板を通して光ビームを前記記録層に集束させて照射することにより前記記録層の情報を再生する情報記録媒体であって透明基板は第一の透明基板と第二の透明基板との少なくとも2組ありそれが貼合わされた構造であり、前記第一の透明基板を通しては第一の記録層の情報を再生し、前記第二の透明基板を通しては第二の記録層の情報を再生する情報記録媒体において、前記第一の記録層の内容を表わすラベルパターン膜は、前記第二の記録層の領域の光ビーム入射面側の前記第二の透明基板面に形成し、前記第二の記録層の内容を表わすラベルパターン膜は、前記第一の記録層の領域の光ビーム入射面側の前記第一の透明基板面に形成し、前記ラベルパターン膜は前記光ビームの波長付近での透過率が大きくその他の波長の一部では反射率あるいは吸収率が大きい特性を有することを特徴とする情報記録媒体。

【請求項3】 ラベルパターン膜はラミネートフィルムである請求項1または2に記載の情報記録媒体。

【請求項4】 ラベルパターン膜は多層干渉膜である請求項1または2に記載の情報記録媒体。

【請求項5】 ラベルパターン膜は青色系色素を樹脂バインダーに混合した膜である請求項1または2に記載の情報記録媒体。

【請求項6】 ラベルパターン膜は赤色系色素を樹脂バインダーに混合した膜である請求項1または2に記載の情報記録媒体。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は光ビームを用いて大容量の情報の記録の再生が可能な光ディスク媒体等の情報記録媒体に関する。

【0002】

【従来の技術】光ディスクはハードディスクと同様に大量な情報の蓄積装置として非常に優れた特徴を有している。特に光ディスクは、情報の記録・再生を光ビームで行い情報蓄積部のみを持ち運ぶことができるため、大容量を必要とする画像データ等のマルチメディア情報データの頒布、運搬媒体として最も適している。

【0003】従来の光ディスク媒体は、0.6mm厚等

の円盤状のポリカーボネイト等の透明基板の表面に、例えば幅0.56 μ m、ピッチ1.12 μ mというような微小な凹部の案内溝を螺旋状に形成し、この基板表面上にスパッタリング等で、GeSbTeやAgInSbTe等の相変化記録材料の薄膜、あるいはTbFeCoTiやTbFeCoTa等の光磁気記録材料の薄膜を形成している。この記録材料の薄膜層は、ZnSとSiO₂との混合物やSi₃N₄化合物やタンタル酸化物等の透明誘電体等の保護膜層で挟まれている場合が多い。さらにその上に、Al合金あるいはSiあるいはSi/Al合金積層膜等の反射膜層あるいは放熱層が設けられる場合も多い。さらにその上に紫外線硬化樹脂や無機誘電体等の保護膜層が設けられる場合も多い。これらの積層構造は上記した機能の他に光の多重干渉効果をも発生させており、この効果によって全体が一つの記録層の働きをしていることになる。これらの積層物は、記録材料薄膜層が内側で透明基板を外側にして2枚を貼合わせる場合が多い。このようにすることにより、両面から情報の再生（及び記録）が可能となるので、情報記録媒体の記録容量を2倍にすることができる。

【0004】また、再生専用光ディスク媒体としては0.6mm厚等の円盤状ポリカーボネイト等の透明基板の表面に、微小な円形あるいは長円形のビットを形成し、この基板表面上にスパッタリング等でAlあるいはAl合金の反射膜層を設けることにより記録層としている。

【0005】この案内溝あるいはビット付き透明基板は、ポジ型フォトリソをレーザビームで露光して光反応を起こした後、現像して凹部を形成し、これを型としてスタンパーを作製し、このスタンパーを用いて射出成形等の方法により大量に複製される。

【0006】この従来の光ディスク媒体の情報の記録・再生は、透明基板を通してレーザ光ビームを凹凸形状の案内溝周辺のうち、溝部（凹部）または平坦部（凸部）のどちらかを一方を情報トラックとして照射することにより行う。

【0007】このレーザ光ビームは、対物レンズによって直径1 μ m弱程度に絞込まれる。この小さく絞込まれたレーザ光ビームを記録層に合焦させるために、フォーカスサーボが行われる。

【0008】上記案内溝は、レーザ光ビームが情報トラック位置を正確に位置決め追従するトラックサーボのために用いられる。レーザ光ビームと案内溝との位置ずれ信号（トラック誤差信号）はプッシュプル法等で検出される。すなわち、光ディスク媒体からの反射光のファーストフィールドパターンを2つの受光領域を有する2分割の光検出器で検出し、両受光領域で検出された光電流の差より光ディスク媒体上の案内溝とレーザ光ビームとの位置ずれを検出する。このトラックサーボ用の案内溝の深さは、トラック誤差信号が一番大きくなる $\lambda/8$ 近傍の

値あるいは $3\lambda/8$ 近傍の値(ここで λ は透明基板中のレーザ光ビームの波長)に設定されるのが普通である。

【0009】この記録・再生用情報トラックは、一般に一周に一つあるいは複数の情報記録単位区画に分けられ、それぞれにはアドレス番号が割り当てられている。

【0010】情報の記録は、光ディスク媒体を回転させることにより記録材料の薄膜層を所定の速度で移動させ、透明基板を通して入射したレーザ光ビームが情報トラック上に位置するようにトラックサーボを行いつつ記録材料薄膜層に合焦させるようにフォーカスサーボを行いながら、記録する情報に応じてレーザ光ビームの強度を変調して行う。記録材料が相変化材料の場合には、非晶質化レベルと結晶化レベルとの間になるようにレーザ光強度を $Pw1$ と $Pw2$ ($Pw1 > Pw2$) とに変調してオーバーライト(重ね書き)して行う。すなわち、相変化材料薄膜層を熔融する程度の光強度 $Pw1$ のレーザ光ビームを照射した区間では非晶質状態のマークが形成され、前記非晶質マーク以外の区間は熔融しない程度の光強度 $Pw2$ のレーザ光ビームを照射するので結晶化状態となる。したがって、非晶質マーク以外の区間は、照射前の状態が非晶質であろうと結晶質であろうと結晶状態となるので、情報が既に記録されている場所であってもオーバーライト(重ね書き)されることになる。

【0011】この光ディスク媒体に記録されている情報の再生は、光ディスク媒体を回転させることにより記録材料の薄膜層を所定の速度で移動させ、透明基板を通して入射したレーザ光ビームが情報トラック上に位置するようにトラックサーボを行いつつ記録材料薄膜層に合焦させるようにフォーカスサーボを行いながら、上記記録時の強度よりも弱い強度一定のレーザ光ビーム Pr ($Pw1 > Pw2 > Pr$) を照射し、光ディスク媒体からの反射光を光検出器で受光して、反射光量の変化で情報の再生を行う。記録材料が相変化材料の場合には、非晶質状態と結晶状態で反射率及び/あるいは位相差が異なることを利用して行う。

【0012】このような情報記録媒体の記録再生装置は薄型化が望まれている。このため、情報記録媒体にはカートリッジのないことが望ましい。

【0013】

【発明が解決しようとする課題】しかしながらこのようなカートリッジなしで表裏両面から情報再生が可能な情報記録媒体では、ユーザが判読しやすい大きさのラベルを付けられないという問題点があった。

【0014】本発明は、カートリッジなしで、表裏両面から情報再生が可能な大きなラベル付きの情報記録媒体を提供することを目的としている。

【0015】

【課題を解決するための手段】前記の目的は以下の手段によって達成される。

【0016】すなわち、本発明は、透明基板上に記録層

を少なくとも設け、前記透明基板を回転させながら前記透明基板を通して光ビームを前記記録層に集束させて照射することにより前記記録層の情報を再生する情報記録媒体において、前記記録層の領域の前記光ビーム入射面側の前記透明基板面にラベルパターン膜を形成し、前記ラベルパターン膜は前記光ビームの波長付近での透過率が大きくその他の波長の一部では反射率あるいは吸収率が大きい特性を有することを特徴とする情報記録媒体及び透明基板上に記録層を少なくとも設け、前記透明基板を回転させながら前記透明基板を通して光ビームを前記記録層に集束させて照射することにより前記記録層の情報を再生する情報記録媒体であって、透明基板は第一の透明基板と第二の透明基板との少なくとも2組ありそれが貼合わされた構造であり、前記第一の透明基板を通しては第一の記録層の情報を再生し、前記第二の透明基板を通しては第二の記録層の情報を再生する情報記録媒体において、前記第一の記録層の内容を表わすラベルパターン膜は、前記第二の記録層の領域の光ビーム入射面側の前記第二の透明基板面に形成し、前記第二の記録層の内容を表わすラベルパターン膜は、前記第一の記録層の領域の光ビーム入射面側の前記第一の透明基板面に形成し、前記ラベルパターン膜は前記光ビームの波長付近での透過率が大きくその他の波長の一部では反射率あるいは吸収率が大きい特性を有することを特徴とする情報記録媒体を提供するものであり、ラベルパターン膜はラミネートフィルムであること、前記ラベルパターン膜は多層干渉膜であること、前記ラベルパターン膜は青色系色素を樹脂バインダーに混合した膜であること、前記ラベルパターン膜は赤色系色素を樹脂バインダーに混合した膜であることを含む。

【0017】

【発明の実施の形態】以下、本発明の実施の形態を図面を参照して説明する。

【0018】

【実施例】以下、本発明の実施例を図面を参照して説明する。

【0019】図1は本発明の情報記録媒体を説明するための概略断面図である。図1においては、光ディスク媒体を例としている。透明基板11の上には記録層12が形成されており、透明基板11に関して記録層12の反対側にその内容を示すラベルパターン膜13を形成する。この透明基板11、記録層12、ラベルパターン膜13が一つの記録媒体素子14である。透明基板21、記録層22、ラベルパターン膜23からなるもう一つの記録媒体素子24を用意し、ラベルパターン膜13、23が外側になるように接着層30を介して貼合わせて、表裏両面から情報再生が可能な情報記録媒体を完成される。なおここでいう記録層12、22とは、透明基板にビットを設けその上に反射層を設けたいわゆる既記録層の場合をも含むものである。記録層12の情報再生は透

明基板11を通して照射する再生用光ビーム15で行い、記録層22の情報再生は透明基板21を通して照射する再生用光ビーム25で行う。この再生用光ビームは、ラベルパターン膜を通して記録層に照射することができることに本発明の特徴がある。本発明では再生用光ビームがラベルパターン膜を透過できるようなラベルパターン膜材料を選択することにより、再生用光ビームの方向とラベル判読方向16、26とを同じにできるとともに、記録層領域とラベルパターン領域とを重ねることができるので大きなラベルが可能となる。このため両面貼合わせ構造が可能となっている。ラベルパターン膜を設ける入射深さ方向の位置としては、記録層からできるだけ離れている方がラベルパターン膜に欠陥があってもあまり問題とならないので望ましい。この意味で、ラベルパターン膜の形成位置は記録層面側ではなく、かつ、透明基板中でもなく、入射面側が必須である。ラベルパターン膜は再生用光ビーム波長の他の波長帯では透過率が大きい必要はなく、他のある波長で反射率が大きくなるようにすることによりラベルパターン膜の判読が良好になる。

【0020】従来の情報記録媒体は図3の概略断面図からもわかるように、透明基板101の上に記録層102が設けられ、その上にラベルパターン膜103が設けられている。記録層102の情報の再生は再生用光ビーム105を透明基板101を通して照射することにより行うが、ラベルの判読はラベルパターン膜側からであるため、両面貼合わせ構造は不可能となっている。

【0021】ラベルパターン膜としては、多層干渉膜を用いたラミネートフィルムを貼付けるあるいは多層干渉膜を直接透明基板に成膜することで形成できる。再生用光ビームの波長付近での透過率を大きくし、それ以外の波長の一部では反射率あるいは吸収率を大きくする（再生波長以外のすべての波長で反射率あるいは吸収率を大きくする必要はない）。このような特性を有することによりラベルの判読が容易になる。このようにするには多重干渉設計法を用いれば実現できる。ラミネートフィルムのほうが、多色のラベルパターン膜を形成し易いのでより望ましい。ラベルパターン膜形成の別の方法としては、再生用光ビームが赤色の場合には、赤色付近の波長の光に対して透過率の大きい色素すなわち青色系色素を透明樹脂バインダーに混合したものを用い、再生用光ビームが青色の場合には、青色付近の波長の光に対して透過率の大きい色素すなわち赤色系色素を透明樹脂バインダーに混合したものを用いることができる。

【0022】透過率をあるレベル以上確保する波長としては、再生用光ビームの波長に加えて記録可能型媒体の場合には記録用光ビームの波長でも必要である。

【0023】なお、情報記録媒体を情報記録再生装置に載せて使用する媒体の場合には、図2のように下側から

再生用光ビームが照射され、上側からしかラベルを判読できない。この場合のような使われ方の媒体としては、図2のように、第一の透明基板41を通して情報を再生する第一の記録層42の内容を表わすラベルパターン43は第二の透明基板51に設け、第二の透明基板51を通して情報を再生する第二の記録層52の内容を表わすラベルパターン53は第一の透明基板41に設けるのがユーザの使い勝手の観点から望ましい。

【0024】なお、上記説明すべてにおいては情報記録媒体をカートリッジなしの場合で説明したが、カートリッジに入れた情報記録媒体でも、本発明の方法を用いている場合は、本発明の権利の範囲であることはいうまでもない。

【0025】

【発明の効果】以上説明したように、本発明の情報記録媒体によれば、カートリッジなしであっても判読し易い大きさのラベルが付いた表裏両面から情報再生が可能な情報記録媒体が得られる。

【図面の簡単な説明】

【図1】本発明の情報記録媒体を説明するための概略断面図である。

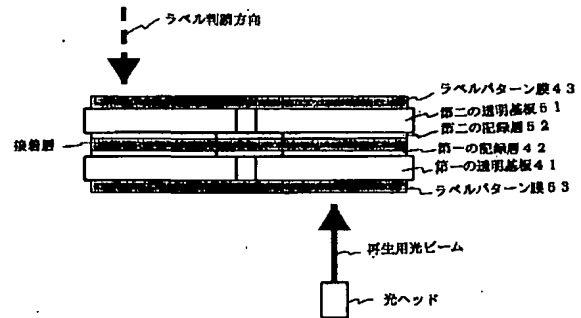
【図2】本発明の他の情報記録媒体を説明するための概略断面図である。

【図3】従来の情報記録媒体の概略断面図である。

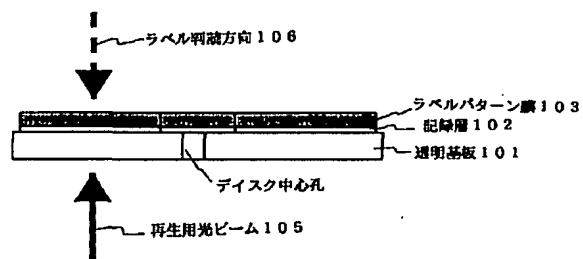
【符号の説明】

- | | |
|-----|----------|
| 11 | 透明基板 |
| 12 | 記録層 |
| 13 | ラベルパターン膜 |
| 14 | 記録媒体素子 |
| 15 | 再生用光ビーム |
| 16 | ラベル判読用方向 |
| 21 | 透明基板 |
| 22 | 記録層 |
| 23 | ラベルパターン膜 |
| 24 | 記録媒体素子 |
| 25 | 再生用光ビーム |
| 26 | ラベル判読方向 |
| 30 | 接着層 |
| 41 | 第一の透明基板 |
| 42 | 第一の記録層 |
| 43 | ラベルパターン膜 |
| 51 | 第二の透明基板 |
| 52 | 第二の記録層 |
| 53 | ラベルパターン膜 |
| 101 | 透明基板 |
| 102 | 記録層 |
| 103 | ラベルパターン膜 |
| 105 | 再生用ビーム |
| 106 | ラベル判読方向 |

【図2】



【図3】



light sensitive cell of 2 division which has two light-receiving fields, and was detected in both the light-receiving field. As for the depth of the guide rail for these truck servoes, it is common to be set as about $\lambda/8$ value, or 3λ / about eight value (for λ to be the wavelength of the laser beam beam in a transparent substrate here) to which a truck error signal becomes the largest.

[0009] Generally this code track for record / reproduction is divided into one or more information record unit partitions by round, and the address number is assigned to each.

[0010] Informational record is performed by modulating the intensity of a laser beam beam according to the information to record, performing [move the thin film layer of record material at the rate of predetermined, perform a truck servo so that the laser beam beam which carried out incidence through the transparent substrate may be located on a code track, and] a focus servo by rotating an optical disk medium, so that a record material thin film layer may be made to focus. When record material is phase-change material, it carries out by the over-write [laser beam intensity $/2 / P_w / P_{w1}$ and $/(P_{w1} > P_{w2}) /$ modulate and] (overwrite) so that it may come between amorphous-ized level and crystallization level. Namely, in the section which irradiated the laser beam beam of the optical intensity P_{w1} of the grade which fuses a phase-change material thin film layer, the mark of an amorphous state is formed, and since the sections other than the aforementioned amorphous mark irradiate the laser beam beam of the optical intensity P_{w2} of the grade which is not fused, they will be in a crystallization state. Therefore, an over-write (overwrite) since the sections other than an amorphous mark will be in a crystallized state if the state before irradiation will probably be amorphous and they will be crystalline substances, even if information is the place already recorded.

[0011] Reproduction of the information currently recorded on this optical disk medium The thin film layer of record material is moved at the rate of predetermined by rotating an optical disk medium. Performing [perform a truck servo, and] a focus servo so that a record material thin film layer may be made to focus so that the laser beam beam which carried out incidence through the transparent substrate may be located on a code track The laser beam beam P_r of on-the-strength regularity weaker than the intensity at the time of the above-mentioned record ($P_{w1} > P_{w2} > P_r$) is irradiated, the reflected light from an optical disk medium is received by the light sensitive cell, and information is reproduced by change of the amount of reflected lights. When record material is phase-change material, it carries out by the amorphous state and the crystallized state using a reflection factor and/differing from phase contrast.

[0012] As for the record regenerative apparatus of such an information record medium, thin shape-ization is desired. For this reason, it is desirable for there to be no cartridge in an information record medium.

[0013]

[Problem(s) to be Solved by the Invention] However, with the information record medium in which information reproduction is possible, there was a trouble that the label of the size which a user tends to decipher could not be attached without such a cartridge, from front reverse side both sides.

[0014] this invention aims without the cartridge at offering the big information record medium with a label in which information reproduction is possible from front reverse side both sides.

[0015]

[Means for Solving the Problem] The aforementioned purpose is attained by the following meanses.

[0016] Namely, this invention is set to the information record medium which reproduces the information on the aforementioned record layer by converging a light beam on the aforementioned record layer, and irradiating it through the aforementioned transparent substrate, preparing a record layer at least on a transparent substrate, and rotating the aforementioned transparent substrate. A label pattern film is formed in the aforementioned transparent substrate side by the side of the aforementioned light beam plane of incidence of the field of the aforementioned record layer. The aforementioned label pattern film prepares a record layer at least on the information record medium characterized by having the property that the permeability near the wavelength of the aforementioned light beam is large, and a reflection factor or an absorption coefficient is large on a part of other wavelength, and a transparent substrate. It is the information record medium which reproduces the information on the aforementioned record layer by converging a light beam on the aforementioned record layer, and irradiating it through the aforementioned transparent substrate, rotating the aforementioned transparent substrate. A transparent substrate is the structure of the first transparent substrate and the second transparent substrate where there are at least 2 sets and it was ***** (ed). In the information record medium which reproduces the information on the first record layer if it lets the transparent substrate of the above first pass, and reproduces the information on the second record

layer if it lets the transparent substrate of the above second pass The label pattern film showing the content of the record layer of the above first The label pattern film which forms in the transparent substrate side of the above second by the side of the light beam plane of incidence of the field of the record layer of the above second, and expresses the content of the record layer of the above second It forms in the transparent substrate side of the above first by the side of the light beam plane of incidence of the field of the record layer of the above first. A reflection factor or the absorption coefficient of the aforementioned label pattern film is what the permeability near the wavelength of the aforementioned light beam provides with the information record medium characterized by having the property that it is large and is large on a part of other wavelength. The aforementioned label pattern film is [that a label pattern film is a laminate film,] a multilayer interference film, It includes that the aforementioned label pattern film is a film which mixed blue system coloring matter to the resin binder, and that the aforementioned label pattern film is a film which mixed red system coloring matter to the resin binder.

[0017]

[Embodiments of the Invention] Hereafter, the gestalt of operation of this invention is explained with reference to a drawing.

[0018]

[Example] Hereafter, the example of this invention is explained with reference to a drawing.

[0019] Drawing 1 is an outline cross section for explaining the information record medium of this invention. The optical disk medium is made into the example in drawing 1. The record layer 12 is formed on the transparent substrate 11, and the label pattern film 13 which shows the content to the opposite side of the record layer 12 about the transparent substrate 11 is formed. This transparent substrate 11, the record layer 12, and the label pattern film 13 are one record intermediation voxel child 14. Another record intermediation voxel child 24 who consists of the transparent substrate 21, a record layer 22, and a label pattern film 23 is prepared, and the information record medium in which information reproduction is possible is completed from ***** and front reverse side both sides through a glue line 30 so that the label pattern films 13 and 23 may become outside. In addition, the record layers 12 and 22 here also include the case of the so-called recorded layer which established the pit in the transparent substrate and prepared the reflecting layer on it. Information reproduction of the record layer 12 is performed by the light beam 15 for reproduction irradiated through the transparent substrate 11, and information reproduction of the record layer 22 is performed by the light beam 25 for reproduction irradiated through the transparent substrate 21. This light beam for reproduction has the feature of this invention in the ability of a record layer to be irradiated through a label pattern film. In this invention, since a record layer field and a label pattern space can be piled up while being able to make the same the direction and the label decipherment directions 16 and 26 of the light beam for reproduction by choosing the label pattern film material into which the light beam for reproduction can penetrate a label pattern film, a big label becomes possible. For this reason, double-sided lamination structure is possible. Since it seldom becomes a problem even if a defect has the one distant from the record layer as much as possible in a label pattern film as a position of the incidence depth direction in which a label pattern film is prepared, it is desirable. In this meaning, the formation position of a label pattern film is not a record stratification plane side, and is not among a transparent substrate, either, and its plane-of-incidence side is indispensable. A label pattern film does not need to have large permeability in other wavelength ranges of the light beam wavelength for reproduction, and when making it a reflection factor become large on wavelength with others, decipherment of a label pattern film becomes good.

[0020] As the conventional information record medium shown also in the outline cross section of drawing 3, the record layer 102 is formed on the transparent substrate 101, and the label pattern film 103 is formed on it. Although reproduction of the information on the record layer 102 is performed by irradiating the light beam 105 for reproduction through the transparent substrate 101, since decipherment of a label is from a label pattern film side, double-sided lamination structure is impossible.

[0021] As a label pattern film Or it sticks the laminate film using the multilayer interference film, a multilayer interference film can be formed by forming membranes to a direct transparent substrate. The permeability near the wavelength of the light beam for reproduction is enlarged, and a reflection factor or an absorption coefficient is enlarged on a part of other wavelength (it is necessary to enlarge a reflection factor or an absorption coefficient on no wavelength other than reproduction wavelength). Decipherment of a label becomes easy by having such a property. It is realizable if a multiplex interference design method is used for doing in this way. Since the way of a laminate film tends to form a multicolor label pattern film, it is more

desirable. As an option of label pattern film formation, when the light beam for reproduction is red, when the light beam for reproduction is blue, what mixed to the transparent resin binder to the light of the wavelength near blue, the large coloring matter, i.e., the red system coloring matter, of permeability, can be used using what mixed to the transparent resin binder to the light of the wavelength near red, the large coloring matter, i.e., the blue system coloring matter, of permeability.

[0022] In addition to the wavelength of the light beam for reproduction, in the case of a recordable type medium, as wavelength which secures permeability more than a certain level, it is required also of the wavelength of the light beam for record.

[0023] In addition, in the case of the medium which carries and uses an information record medium for an information record regenerative apparatus, the light beam for reproduction is irradiated from the bottom like drawing 2, and a label can be deciphered only from the bottom. As a medium of a way like [in this case] used, the label pattern 43 showing the content of the first record layer 42 which reproduces information through the first transparent substrate 41 is formed in the second transparent substrate 51 like drawing 2. As for the label pattern 53 showing the content of the second record layer 52 which reproduces information through the second transparent substrate 51, preparing in the first transparent substrate 41 is desirable from a viewpoint of a user's user-friendliness.

[0024] In addition, although the information record medium was explained by the case where he has no cartridge, in all the above-mentioned explanation, when the method of this invention is used also with the information record medium put into the cartridge, it cannot be overemphasized that it is the range of the right of this invention.

[0025]

[Effect of the Invention] As explained above, even if he has no cartridge, according to the information record medium of this invention, the information record medium in which information reproduction is possible is obtained from front reverse side both sides with the label of the size which is easy to decipher.

[Translation done.]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision
of rejection]

[Date of requesting appeal against examiner's
decision of rejection]

[Date of extinction of right]

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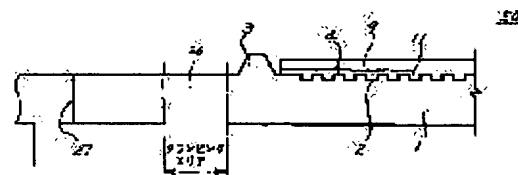
(72)Inventor : KOJIMA TAKEO

(54) OPTICAL INFORMATION RECORDING MEDIUM

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a high-density optical disk which is prevented from the intrusion of rubbing flaws into substrate surface, a light transparent sheet and a label layer in temporarily storing substrate during the course of a manufacturing process and completed optical disk.

SOLUTION: The optical information recording medium 50 which has a reflecting film 4 deposited on an information signal surface 2 formed on a substrate 1 and is provided with light transparent sheet 9 thinner than the substrate 1 with a light transparent adhesive 11 in the upper part of the reflecting film 4 is provided with a stack rib 3 on the information signal 2 surface side of the substrate 1. The height of the stack rib 3 when the light transparent sheet 9 having a hold diameter grater than the central hole 27 of the substrate 1 is disposed on the side outer than the external diameter side of the stack rib 3 is set higher by at least 0.08 to 0.5 mm than the sum of the thickness of the light transparent sheet 9 and the thickness of the adhesive 11.



LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

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CLAIMS

[Claim(s)]

[Claim 1] In the optical information record medium with which a reflective film is formed and the light-transmission nature sheet thinner than the aforementioned substrate is prepared by the adhesives of light-transmission nature on the information signal side formed in a substrate at the upper part of the aforementioned reflective film The height of the aforementioned stack rib at the time of preparing a stack rib in the aforementioned information signal side side of the aforementioned substrate, and preparing the aforementioned light-transmission nature sheet which has the bigger aperture than the feed hole of the aforementioned substrate outside the outer-diameter section of the aforementioned stack rib The optical information record medium characterized by setting up more highly at least 0.08mm - 0.5mm than the sum of the thickness of the aforementioned light-transmission nature sheet, and the thickness of the aforementioned adhesives.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] Especially this invention relates to the optical information record medium (it is hereafter called an optical disk) which thin-shape-izes thickness of the substrate by the side of the reading side as for which a laser beam carries out incidence with respect to an optical information record medium, and enables high recording density-ization.

[0002]

[Description of the Prior Art] In recent years, as for the optical disk, development is furthered aiming at high density, large capacity, and the miniaturization. Densification is possible by shortening wavelength of a laser beam, or enlarging numerical aperture of the objective lens for irradiating the light at the time of record and reproduction of optical pickup, and making small the diameter of a spot of record / reproduction light. Thus, if numerical aperture of an objective lens is enlarged, it is necessary to make thin thickness of the substrate by the side of the plane of incidence of the optical disk which reproduction light is irradiated and this passes. This is because the permissible dose of the angle (tilt angle) a disk side shifts [angle] from a perpendicular becomes small to the optical axis of optical pickup, and is because this tilt angle tends to be influenced of the aberration by the thickness of a substrate, or a birefringence. Therefore, a next generation type optical disk makes thickness of a substrate thin, and is made to make a tilt angle as small as possible. [0003] For example, if it is in CD, DVD whose storage capacity is 6 to 8 times the CD to substrate thickness by the side of plane of incidence being set to about 1.2mm is the thickness of about 0.6mm and the half of those. Moreover, recently, if there is a demand that he wants to make it the large storage capacity of 15GB or more and the same storage capacity per disk whole surface of a size as CD or DVD is described as an example in that case, the substrate thickness by the side of plane of incidence will be set to about 0.3mm which is the half of said DVD. Moreover, if thickness by the side of plane of incidence is set to about 0.1mm, it will become the storage capacity of 20GB. For manufacturing such a disk of high storage capacity by the conventional injection-molding method, a substrate is too thin, and since it is difficult, some another production methods are proposed.

[0004] if law is expressed on the other hand, the substrate into which the information signal went by the same injection-molding method as the conventional technology etc. is produced, on this information signal side, reflective films, such as aluminum, will be formed and the light-transmission nature sheet of the size same on it as a substrate will be stuck by the spin lamination method etc. with light-transmission nature adhesives And the plane of incidence of reproduction light is the method of performing from a light-transmission nature sheet side.

[0005] The outer diameter of the substrate at this time is the same $\phi 120\text{mm}$ as said CD and DVD, and the thickness of 0.6mm or more is needed for forming the substrate of this size by the injection-molding method. Therefore, the direction of the light-transmission nature sheet which prepared reproduction light in the side which carries out incidence becomes a bird clapper from the thickness of the substrate which formed the information signal according to the law on the other hand of said next generation type optical disk thinly.

[0006] By the way, at the manufacturing process of CD or DVD, movement and temporary storage between processes are performed by accumulating a substrate on a pin. In that case, the stack rib which carried out the ring-like heights configuration is prepared in this substrate so that the blemish depended for the signal side and plane-of-incidence layer of a substrate contacting, and rubbing may not enter. Moreover, the label layer which the title etc. described is prepared in the field opposite to the field in which the stack rib is